

Appl. No. 09/579,371  
Amdt. Dated 06/17/2004  
Reply to Office Action of 4/20/2004

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**Listing of Claims**

Claims 1-2 (canceled)

Claim 3 (twice amended): A method for measuring network performance comprising the steps of:

dividing packets flowing through a first point into frames, the first point being any point in the network that supports a packet flow, said dividing step comprising:

selecting a header associated with the packets flowing through the first point;

associating the header with the packet flow;

storing the header in a storage associated with the packet flow;

incrementing a packet count; and

detecting duplicate packets generated by network nodes;

capturing information n about the packets in packages that correspond to the frames;

correlating each package with packets flowing through a second point, the second point being any other point in the network that supports the packet flow; and

calculating network performance information based on the correlated packages

Claim 4 (currently amended): The A method of claim 3 for measuring network performance, comprising the steps of:

dividing packets flowing through a first point into frames, the first point being any point in the network that supports a packet flow, said dividing steps comprising

selecting a header associated with the packets flowing through the first point;

associating the header with the packet flow;

storing the header in a storage associated with the packet flow;

incrementing a packet count; and

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detecting duplicate packets, wherein the detecting steps comprises searching in storage for another header that matches the selected header ;  
capturing information about the packets in packages that correspond to the frames;  
correlating each package with packets flowing through a second point, the second point being any other point in the network that supports the packet flow; and  
calculating network performance information based on the correlated packages.

Claim 5 (currently amended): The A method of claim 3 for measuring network performance, comprising the steps of:

dividing packets flowing through a first point into frames, the first point being any point in the network that supports a packet flow; said dividing step comprising

selecting a header associated with the packets flowing through the first point;  
associating the header with the packet flow;  
storing the header in a storage associated with the packet flow;  
incrementing a packet count; and  
detecting duplicate packets;

capturing information about the packets that correspond to the frames;  
correlating each package with packets flowing through a second point, the second point being any other point in the network that supports the packet flow; and  
calculating network performance information based on the correlated packages;  
and

wherein a duplicate packet count is incremented when a duplicate packet is detected.

Claim 6 (currently amended): The A method of claim 2, wherein for measuring network performance, said method comprising the steps of:

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dividing packets flowing through a first point into frames, the first point being any point in the network that supports a packet flow; said dividing step comprising

selecting a header associated with the packets flowing through the first point;

associating the header with the packet flow; and

storing the header in a storage associated with the packet flow, wherein the storing step is repeated to form sequences of headers in the storage;

capturing information about the packets in packages that correspond to the frames;

correlating each package with packets flowing through a second point, the second point being any other point in the network that supports the packet flow; and

calculating network performance information based on the correlated packages.

Claim 7 (original): The method of claim 6, wherein the step of storing the header further comprises storing header order of capture information in a second storage associated with the selected header.

Claim 8 (original): The method of claim 6, wherein the headers in the storage are stored in the form of a hash table data structure.

Claims 9-10 (canceled)

Claim 11 (currently amended): The A method of claim 10 wherein for measuring network performance, comprising:

dividing packets flowing through a first point into frames, the first point being any point in the network that supports a packet flow;

capturing information about the packets in packages that correspond to frames;

correlating each package with packets flowing through a second point, the second point being any point in the network that supports the packet flow and

calculating network performance information based on the correlated packets; and

wherein the step of capturing information comprising the steps of

retrieving consecutive headers from a frame and

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forming a package including information that uniquely identifies consecutive packets corresponding to the consecutive headers, the step of forming a package further comprises comprising setting the package size to represent the number of packets in the package.

Claim 12 (currently amended): The A method of claim 10 for measuring network performance comprising:

dividing packets flowing through a first point into frames, the first point being any point in the network that supports a packet flow;

capturing information about the packets in packages that corresponds to the frames;

correlating each package with packets flowing through a second point, the second point being any point in the network that supports the packet flow; and

calculating network performance information based on the correlated packages;  
and

wherein the step of capturing information comprises the steps of  
retrieving consecutive headers from a frame and

forming a package including information that uniquely identifies consecutive packets corresponding to the consecutive headers, the step of forming a package further comprises comprising selecting a source information, a destination information, an Internet Protocol identifier, a fragment flag, and a fragment offset from each packet in the package as the information that uniquely identifies consecutive packets corresponding to the consecutive headers.

Claim 13 (canceled)

Claim 14 (currently amended): The A method of claim 10, wherein for measuring network performance comprising:

dividing packets flowing through a first point into frames, the first point being any point in the network that supports a packet flow;

capturing information about the packets in packages that correspond to the frames;

correlating each package with packets flowing through a second point, the second point being any point in the network that supports the packet flow; and

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calculating network performance information based on the correlated packages;  
and

wherein the step of capturing information comprises the steps of  
retrieving consecutive headers from a frame

forming a package including information that uniquely identifies  
consecutive packets corresponding the consecutive headers, the step of retrieving further  
comprises comprising receiving the last n headers in the frame, n being an integer  
number.

Claim 15 (canceled)

Claim 16 (currently amended): The A method of claim 15, wherein for measuring  
network performance, said method comprising the steps of:

dividing packets flowing through a first point into frames, the first point being any  
point in the network that supports a packet flow;

capturing information about the packets in packages that correspond to the  
frames;

correlating each package with packets flowing through a second point, the second  
point being any other point in the network that supports the packet flow; and

calculating network performance information based on the correlated package,  
said method further comprising

storing in a storage a header associated with the packets flowing through the  
second point, the step of storing further comprises comprising

selecting the header;

associating the header with the packet flow; and

storing the header in a storage location associated with the packet flow.

Claim 17 (twice amended): A method for measuring network performance comprising:

dividing packets flowing through a first point into frames, the first point being any  
point in the network that supports a packet flow;

capturing information about the packets in packages that correspond to the  
frames;

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correlating each package with packets flowing through a second point, the second point being any point in the network that supports the packet flow;

storing in a storage a header associated with the packets flowing through the second point, said storing step comprising selecting the header, associating the header with the packet flow, storing the header in a storage location associated with the packet flow, incrementing a packet count, and detecting duplicate packets generated by network nodes; and

calculating network performance information based on the correlated packets.

Claim 18 (currently amended): The A method of claim 17 wherein for measuring network performance comprising:

dividing packets flowing through a first point into frames, the first point being any point in the network that supports a packet flow;

capturing information about the packets that correspond to the frames;

correlating each package with packets flowing through a second point, the second point being any point in the network that supports the packet flow;

storing in a storage a header associated with the packets flowing through the second point, said storing step comprising selecting the header, associating the header with the packet flow, storing the header in a storage location associated with the packet flow, incrementing a packet count, and detecting duplicate packets, the detecting step comprises comprising searching in the storage for another that matches the selected header; and

calculating network performance information based on the correlated packets.

Claim 19 (currently amended): The A method , of claim 17 for measuring network performance comprising:

dividing packets flowing through a first point into frames, the first point being any point in the network that supports a packet flow;

capturing information about the packets in packages that correspond to the frames;

correlating each package with packets flowing through a second point, the second point being any point in the network that supports the packet flow;

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storing in a storage a header associated with the packets flowing through the second point, said storing step comprising selecting the header, associating the header with the packet flow, storing the header in a storage location associated with the packet flow, incrementing a packet count and detecting duplicate packets; and

calculating network performance information based on the correlated packets; and  
wherein a duplicate packet count is increment when a duplicate packet is detected.

Claim 20 (currently amended): The A method of claim 15 wherein for measuring network performance, said method comprising the steps of:

dividing packets flowing through a first point into frames, the first point being any point in the network that supports a packet flow;

capturing information about the packets in packages that correspond to the frames;

correlating each package with packets flowing through a second point, the second point being any other point in the network that supports the packet flow;

storing in a storage a header associated with the packets flowing through the second point, the step of storing the header in a storage location is being repeated to form a sequence of headers in the storage; and further comprises

storing header order of capture information in a second storage, the second storage being associated with the selected header; and

calculating network performance information based on the correlated packages.

Claim 21 (previously amended): A method for measuring network performance comprising:

dividing packets flowing through a first point into frames, the first point being any point in the network that supports a packet flow;

capturing information about the packets in packages that correspond to the frames;

correlating each package with packets flowing through a second point, the second point being any point in the network that supports the packet flow, the correlating step comprising associating each package with the packet flow, searching for a match between packet information selected in each packet and stored header information corresponding to the packet flow, and calculating a destination frame size; and

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calculating network performance based on the correlated packages.

Claim 22 (original): The method of claim 21, wherein the step of calculating a destination frame comprises determining a number of packets in between a match of a previous package and a match of present package.

Claim 23 (original): The method of claim 21, wherein the searching step comprises examining a number of stored packet headers in the storage.

Claim 24 (canceled)

Claim 25 (previously amended): A method for measuring network performance comprising:

dividing packets flowing through a first point into frames, the first point being any point in the network that supports a packet flow;

capturing information about the packets in packages that correspond to the frames;

correlating each package with packets flowing through a second point, the second point being any point in the network that supports the packet flow; and

calculating network performance information based on the correlated packages, the step of calculating comprising determining a number of packets lost between the first point and the second point, the step of determining the number of packets lost comprising

determining a source frame size from a correlated package;

calculating a destination frame size;

subtracting the destination frame size from the source frame size; and

adding a number of duplicate packets generated between the first point and second point in the network to the subtraction of the destination frame size from the source frame size.

Claim 26 (canceled)

Claim 27 (currently amended): The A method of claim 1 wherein for measuring network performance, said method comprising the steps of:

dividing packets flowing through a first point into frames, the first point being any point in the network that supports a packet flow;

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capturing information about the packets in packages that correspond to the frames;

correlating each package with packets flowing through a second point, the second point being any other point in the network that supports the packet flow; and

calculating network performance information based on the correlated packages, the step of calculating network performance comprising determining a delay experienced by a packet flowing from the first point to the second point in the network, the step of determining the delay comprises comprising

determining a first time at which a packet associated with a correlated package flows through the first point in the network;

determining a second time at which the packet associated with the correlated package flows through the second point in the network; and

subtracting the first time from the second time.

Claim 28 (previously amended): A method for measuring network performance comprising:

dividing packets flowing through a first point into frames, the first point being any point in the network that supports a packet flow;

capturing information about the packets in packages that correspond to frames;

correlating each package with packets flowing through a second point, the second point being any point in the network that supports the packet flow; and

calculating network performance information based on the correlated packages, the step of calculating network performance comprising calculating a number of duplicate packets created between the first point and the second point.

Claim 29 (original): The method of claim 28, wherein the step of calculating the number of packet duplicates comprises:

counting duplicate packets at the first point;

counting duplicate packets at the second point; and

subtracting the count of duplicate packets at the first point from the count of duplicate packets at the second point.

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Claim 30 (previously amended): A method for measuring network performance, said method comprising the steps of:

retrieving packet headers from a first class of packets at a first point in the network, the first point being any point in the network that supports a flow of either the first class of packets or a second class of packets carrying information corresponding to the packets of the first class;

selecting packet headers retrieved at the first point that correspond to a packet flow;

maintaining a first header store to stored the selected headers as the first class of packets flow through the first point;

retrieving packet headers from the first class of packets at a second point in the network, the second point being any other point in the network that also supports the flow of either the first class of packets or the second class of packets;

selecting packet headers retrieved at the second point that correspond to the packet flow;

maintaining a second header storage to stored the selected headers as the first class of packets flow through the second point;

creating a package of information from the first header storage;

sending the package to a monitor associated with the retrieval of packet headers at the second point;

correlating the package with information from the second header storage; and

calculating network performance information using a result of the correlation.

Claims 31-33 (canceled)

Claim 34 (twice amended): The A system of claim 31 for measuring network performance comprising:

at least a first and a second monitoring device for monitoring packets associated with a plurality of packet flows and connected to any point in the network, and

at least a first and a second processing device for determining network performance information, each processing device being respectively connected to each of the first and second monitoring devices, and

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wherein the first processing device comprises a source device that divides packets accessed via the first monitoring device into frames and captures information about the packets in packages corresponding to frames, and the second processing device comprises a destination device that correlates each package with packets accessed via the second monitoring device and calculates the network performance based on the correlated packages, wherein the monitoring devices monitor a packet flow from the plurality of packet flows, and

wherein the captured information about the packets comprises:

source information;

destination information;

an Internet Protocol identifier;

a fragment offset; and

a fragment flag.

35. (twice amended): The A system of claim 31 for measuring network performance comprising:

at least a first and a second monitoring device for monitoring packets associated with a plurality of packet flows and connected to any point in the network; and

at least a first and a second processing device for determining network performance, each processing device being respectively connected to each of the first and second monitoring devices; and

wherein the first processing device comprises a source device that divides packets accessed via the first monitoring device into frames and captures information about the packets in packages corresponding to frames, and the second processing device comprises a destination device that correlates each package with packets accessed via the second monitoring device and that calculates the network performance information based on the correlated packages, wherein the monitoring devices monitor a packet flow from the plurality of packet flows; and

wherein the packages include running duplicate packet count, locally generated sequence number, and locally generated time stamp information for each packet in the package.

Claim 36 (twice amended): The A system of claim 31 for measuring network performance comprising:

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at least a first and a second processing device for determining network performance information, each processing device being respectively connected to each of the first and second monitoring devices; and

wherein the first processing device comprises a source device that divides user data packets accessed via the first monitoring device into frames and captures information about the packets in packages corresponding to frames, and the second processing device comprises a destination device that correlates each package with user data packets accessed via the second monitoring device and that calculates the network performance information based on the correlated packets, wherein the monitoring devices monitor a packet flow from the plurality of packet flows, and

wherein the packages include a packet flow identifier, a frame number, and a package size.

Claims 37-41 (canceled)